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ABSTRACT

The effectiveness of previewing versus discourse analysis as methods of reading instruction was tested. Previewing (supported by schema theory) was based on the premise that helping students relate their knowledge to the content of a reading selection would facilitate comprehension. Discourse analysis (based on research on text structures) reflected the idea that helping students attend to relationships between and within propositions in the microstructure of text would facilitate comprehension. A group of 63 fifth grade students were blocked on reading achievement (high, low), then randomly assigned to one of the two instructional methods. The results showed no significant difference between instructional methods. There was a significant difference between the mean scores of good and poor readers. Of additional interest in the study was student performance on questions concerning implicit and implied propositions. Implicit questions came from propositions represented in the surface structure of text, while implied questions came from propositions not included in the surface structures. Both good and poor readers performed significantly better on questions about implicit rather than implied propositions. (Author/RL)

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The Relationships Between Selected Discourse Analysis Tasks Previewing Strategies and Subsequent Fifth Grade Students' Performance on Measures of Reading Comprehension

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Helping students achieve proficiency in comprehending connected discourse is one of the most important aspects of classroom instruction. It is proposed that information from research and theoretical literature from such seemingly diverse fields as cognitive psychology and linguistics can be used to guide instructional activities designed to facilitate students' comprehension of discourse. Two instructional approaches based upon this research and theoretical literature were used in this investigation. Specifically, this study investigated the effectiveness of two intervention methods on the subsequent performance of better and poorer readers on measures of reading comprehension.

Method one, previewing, was based upon the premise that assisting students in relating relevant past knowledge to the content of a reading selection would facilitate comprehension. This method received support from research on schema theory.

According to schema theory, concepts in memory which include objects, (chair, car), actions (run, throw), events, (party, game), and sequences of events (going to eat in a restaurant) are organized into abstract knowledge structures called schemata (Rumelhart & Ortony, 1977). Based upon a person's experiences in the world, concepts may be elaborated, restricted, or new concepts may emerge. A schema theory view of reading suggests that a reader utilizes this existing knowledge when attempting to construct the semantic meaning of a message.

Writers do not always explicitly express their ideas in the surface structure of their written messages. Thus, readers' may make inferences, fill in the gaps, with their existing knowledge. The extent of inferencing may range on a continuum from minimal inferencing to maximal inferencing.

Minimal inferencing may be necessary if the writer's ideas are explicitly stated in the text. Maximal inferencing may be necessary when writers omit ideas expecting readers to fill in the information from general world knowledge. Thus, schema theory contends that comprehension involves a goodness-of-fit between incoming information and readers' knowledge of the world (Rumelhart and Ortony, 1977). Findings from research support this contention. In some studies subjects' prior knowledge of selected content was assessed (Pearson, Hansen, & Gordon, 1978; Pace, 1978; Ausubel & Youssef, 1963). In other studies investigators manipulated the extent of subjects' prior knowledge (context) by presenting subjects with a relevant picture (Bransford & Johnson, 1972) or a thematic title (Schallert, 1976; Dooling & Mullet, 1973; Sulin & Dooling, 1974; Dooling & Christiaansen, 1977; Anderson & Pichert, 1978). Results revealed that subjects possessing extensive prior knowledge and subjects receiving prior contextual knowledge were more able to account for the incoming information, thus, achieving a higher degree of comprehension.

Method two, discourse analysis, was based upon the premise that increasing students' awareness of text structure, that is, the relationship between and within propositions in the microstructure of text, would facilitate comprehension.

There has been increasing interest and research on the effect of text structure on comprehension (Kintsch, 1974; Meyer, 1975; van Dijk & Kintsch, 1978). One of the reasons for the increased interest and research is that methods for representing the semantic content, the meaning, of text have been developed. Kintsch (1974) proposed a propositional

model for representing the meaning of written discourse. A proposition may be defined as a single idea unit. This unit of meaning is represented in memory by concepts of the words forming the idea unit and is represented in the surface structure of the text by the words expressing the idea. An ordered list of propositions represents the meaning of an entire text. This list contains propositions explicitly expressed in the surface structure of the text. This list may also contain implied propositions representing ideas and connections between ideas which the author omitted when writing the text. To represent the meaning of the text, and to make the text coherent, the implied propositions must be included. When reading the text, the reader may imply these propositions based upon knowledge about the world or based upon other information in the text. Hence, comprehending the meaning of text involves integrating ideas either explicitly expressed or implied by the writer.

Results from research focusing on the effect of text structure on comprehension indicated that readers experienced less difficulty comprehending information represented in the surface structure (Kintsch, 1974; Marshall & Glock, 1978-79; Bridge, Tierney, & Cera, 1978). Poor readers tend to rely on the surface structure to a greater extent than good readers (Marshall & Glock, 1978-79). If the surface structure did not contain cues signaling the relationship between ideas, poor readers experienced difficulty in mentally integrating ideas. Linguistic connectives (i.e., because, to) are surface structure cues signaling the reader to the relationship between ideas in text. The limited research regarding the effect of knowledge of linguistic connectives on

reading comprehension suggested that connectives may aid in making the relationship between ideas in expository prose explicit, thus, more comprehensible (Pearson, 1974-75; Katz & Brent, 1968; Robertson, 1968; Marshall & Glock, 1978-79).

Evidence from research indicated there was a difference in the level of comprehension of propositions which are represented and propositions which are not represented in the surface structure of text. Thus, a question of additional interest in this study was the relative difficulty level of questions based upon implicit and implied propositions. Implicit questions types were defined as items based upon propositions represented in the surface sturcture of the text. Implied questions types were defined as items based upon propositions which were not represented in the surface structure of the text.

In summary, this study attempted to integrate research, theory, and classroom instructional practices to investigate the effectiveness of two intervention methods on fifth grade students subsequent performance on measures of reading comprehension.

METHOD

Subjects

Sixty-three of sixty-five fifth grade students from a private elementary school participated in this study. The two students were not included because their pretest scores were considerably lower than their peers. Subjects were blocked on reading achievement (high,low) based upon their pretest total scores from the Nelson Reading Skills Test, Form 3, and then randomly assigned to one of two instructional methods, previewing or discourse analysis.

Materials

Eighteen expository selections were used during the treatment period. Eleven selections were adapted from trade books, two selections

were adapted from New Practice Readers (Webster Publishers, 1962), and three selections were chosen from Reading for Concepts (Liddle, 1970). According to the Spache Readability Formula, the stories were not too difficult for the subjects.

Multiple choice questions were generated on the detailed propositions of each selection. Specifically, question-answer items about four different connective propositions (causality, purpose, time, location) were written (Turner & Greene, 1977). Connective propositions are important because they provide written discourse with cohesion (Kintsch, 1974; Kintsch & van Dijk),that is, the connective propositions relate the propositions (ideas) in a text to each other. The four particular types of connective propositions were chosen because research on linguistic connectives (Robertson, 1968; Pearson, 1974-75), semantic roles (Christopherson. 1976, 1979; Gomulicki, 1956; Suci & Hamacher, 1972), and information on temporal and spatial relations(Trabasso, Nicholas, Omanson & Johnson, 1977; Hatch, 1971; Mandler & Johnson, 1977 ; Coker, 1979; Robertson, 1968) indicated the four types were essential to the comprehension of text. Connective propositions may or may not be represented in the surface structure of the text, thus, questions relating to implicit and implied connectives were generated. The purpose for generating these question types was to ascertain student performance on these items following instruction in method one, previewing, or method two, discourse analysis.

The four classifications of connective propositions were utilized as the instructional technique in method two, discourse analysis. To reduce the possibility that students, in general, and students in the discourse analysis method, in particular, would establish a predictable performance pattern and read only to answer questions based upon

the connective propositions, other questions were generated. Thus, questions were generated on modifier propositions, and a predicative proposition. In addition, a question assessing the main idea of each selection was included.

Instructional procedure

Subjects in each method were divided into two instructional groups. Each of the four instructional groups included students classified as better and poorer readers according to the pretest scores. Instruction was scheduled for one-half hour time periods. Treatment lasted for twenty days followed by three days of testing.

Subjects in method one, previewing, were taught by the following instructional procedure. General and, then, more specific questions were asked to elicit students' prior knowledge which was related to the content of the selection to be read. Following the discussion, the investigator wrote the title of the selection on the chalkboard and asked students to speculate about the content. Students' guesses were written on the chalkboard. The purpose of this introductory procedure was to encourage students to try and recall information in memory which was relevant to the content of the selection. Students were directed to read the selection and determine how closely their guesses were to the information presented in the selection. After students read and answered the questions, their guesses were discussed. The questions on the stories were also discussed. The importance of using prior knowledge to help in understanding what was being read was explained.

Subjects in method two, discourse analysis, were taught by the following general procedure. (1) A lesson consisted of the presentation

and explanation of a connective proposition, followed by group oral and/or written practice. The connective propositions were presented in the following order: causality, purpose, location, time. During the presentation and explanation, sentences illustrating the proposition being discussed were written on the chalkboard. It was explained that stories contain many ideas. The first idea to be discussed was the idea (proposition) of causality which contained two parts. Answering the question, What happened? would identify the idea expressing the effect. Answering the question, Why? would identify the idea expressing the cause. Students were taught that the surface structure often contains the cue word, because, which links the cause and effect. If the cue word was not in the surface structure, it was explained that the reader must mentally imply the relationship between the cause and effect. Next, students were told that the idea (proposition) of purpose contained two parts. Students were directed to answer the two questions, What was done? and What was the purpose? It was explained that the cue word, to, often links the ideas expressing what was done and the purpose for doing it. If the cue word was not in the surface structure, it was explained that the reader must mentally imply the relationship between the two ideas. Since a proposition of purpose involves intention, the semantic role (case) of agent is important and it was introduced. The semantic roles (cases) of object and instrument were also introduced because they are sometimes involved and important in a proposition of purpose. Thirdly, the idea (proposition) of location was introduced. Location places events or objects in a spatial framework. Students were directed to answer the question, Where? (2) Students read the selection and answered

the accompanying questions. (3) The answers to the questions were discussed. Students were shown where the ideas expressed in the question and answer were explicitly stated in the surface structure of the text. It was also explained if the link connecting the ideas had to be implied. The purpose for reading the selections and completing the questions was to locate the connective propositions and to note the meaningful relation between the propositions (ideas) in the text.

Dependent Measures

Six dependent measures were used. Two of the measures were the Word Meaning and Reading Comprehension components from the Nelson Reading Skills Test, Form 4. Two more measures were the Implied and Implicit components from the Propositional Analysis Test (Schreiner & Shannon, 1979). A template text base representing the meaning of each of the three selections in this test was derived (Turner & Greene, 1977). The multiple choice questions following each selection were based upon selected propositions in the template text base. The Implied component was composed of fifteen questions generated from implied propositions. The Implicit component was composed of twelve question generated from implicit propositions. Students were given a specified amount of time to read the selections. They were given unlimited time to answer the questions but they were not allowed to refer back to the selections. The last two measures were the Selecting the Main Idea Test and the Speed of Noting Details Test, Form A (Schreiner, 1968). In the Speed of Noting Details Test, students were directed to read relatively short passages and answer questions that required the recall of specific details. Students could refer back to the passage. In the Selecting The Main Idea Test, students

read several paragraphs, each of which contained five consecutively numbered sentences. Students selected the one sentence that best expressed the main thought or idea of the paragraph.

Analysis of Data

The data from the six dependent measures of reading comprehension were analyzed by a multivariate analysis of variance. In addition, paired t-tests were used to determine if better and poorer readers performed at a higher level on the Implied or the Implicit components from the Test of Propositional Analysis.

RESULTS

The results obtained by calculating Hoteelings T^2 multivariate test showed no significant difference between the mean scores of the students involved in the two instructional methods, $F_{(6,54)} = .90$, $p < .50$. There was a significant difference favoring better readers when students' scores were blocked on an achievement variable, $F_{(6,54)} = 14.65$, $p < .00$. The means and standard deviations from the six dependent measures are reported in Table 1. Further analysis revealed there was not a significant group-by-method interaction, $F_{(6,54)} = .92$, $p < .49$.

A paired t-test was performed to determine the difference between better readers' performance on the Implied and Implicit components from the Test of Propositional Analysis. There were twelve possible points on the Implicit component and fifteen possible points on the Implied component. In order to directly compare the two means, the mean percentage correct for each test was computed:

$\bar{X}$ (%) = .86 Implicit $\bar{X}$ (%) = .76 Implied $\bar{D}$ (%) = .094 Difference

(S.D. = .12)

The results from the paired t-test revealed that better readers achieved a significantly higher level of performance on the Implicit component, $t_{31} = 4.27$, $p < .00$.

Table 1

Means and Standard Deviations For The Six Dependent Measures

	Details Test	Main Idea Test	Nelson Reading Skills Test: Word Meaning	Nelson Reading Skills Test: Rdng Comp	Test of Propositional Analysis: Implicit	Test of Propositional Analysis: Implied
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
Method						
Previewing	11.28 (4.50)	10.91 (3.16)	24.97 (5.84)	27.47 (5.77)	9.53 (2.06)	9.59 (3.09)
High	13.33 (4.03)	13.13 (1.55)	29.27 (2.74)	31.13 (1.73)	10.47 (1.24)	11.93 (2.28)
Low	9.47) (4.2)	8.94 (2.92)	21.18 (5.19)	24.23 (6.18)	8.70 (2.31)	7.53 (2.06)
Discourse	10.58 (3.39)	10.87 (3.28)	26.55 (4.10)	28.58 (4.74)	9.58 (1.67)	9.81 (2.27)
High	12.62 (2.63)	12.87 (2.09)	29.44 (1.67)	31.19 (2.01)	10.12 (1.09)	11.0 (1.93)
Low	8.4 (2.72)	8.73 (2.99)	23.47 (3.66)	25.8 (5.27)	9.0 (2.0)	8.53 (1.92)
Group						
High (Method 1 & 2)	12.97 (3.34)	13.0 (1.82)	29.35 (2.21)	31.16 (1.84)	10.29 (1.16)	11.45 (2.13)
Low (Method 1 & 2)	8.97 (3.57)	8.84 (2.91)	22.25 (4.61)	24.97 (5.73)	8.84 (2.14)	8.00 (2.03)

A paired t-test was also performed to determine the difference between poorer readers' performance on the Implied and Implicit components. The mean percentage correct for each test was, again, computed:

$\bar{X}$ (%) = .74 Implicit $\bar{X}$ (%) = .53 Implied $\bar{D}$ (%) = .20 Difference

(S.D. = .16)

The results from the paired t-test also showed that poorer readers' performance was significantly better on the Implicit component, $t_{32} = 7.07$, $p < .00$.

DISCUSSION

There was no significant difference between methods. Several factors may have contributed to this result. One, instruction over an extended period of time may be needed to effect changes on standardized reading tests which are global in nature. The Word Meaning and Reading Comprehension components from the Nelson Reading Skills Test are standardized tests. The Selecting the Main Idea Test and the Speed of Noting Details Test can also be considered standardized reading tests. Treatment in this study was of a longitudinal nature; however, it may not have been of sufficient length to allow students to achieve competency in either method. Therefore, the possibility of obtaining a significant difference on a standardized measure was severely restricted. Although results from previous research are conflicting, this explanation receives support from the research (Vacca, 1975; Schachter, 1977; Hansen, 1979). Two, the easy readability level of the selections used during treatment suggested that the vocabulary was already known by the subjects. Thus, students were not expanding their vocabularies to the extent required to effect significant change in scores on the Word Meaning test. Three,

only four types of connective propositions specified by Turner and Greene (1977) were used in the discourse method during treatment. To obtain a difference, instruction may be needed in either different types of propositions or all the propositions. Four, the testing procedure used for the Test of Propositional Analysis, Implied and Implicit components, differed from instructional procedure. During instruction, subjects in the discourse method were encouraged to analyze the text. In contrast, during the test, subjects were not allowed to refer back to the selection. When students, especially poorer readers, are encouraged to use a technique and then are not allowed to use it, the possibility exists that a lower level of performance will result.

Since students in both methods performed in relatively the same manner, it cannot be stated that one instructional method is better than the other for helping students with either type of question. However, previous research indicated that helping students link their prior knowledge to new information in the selection to be read does enhance comprehension (Schachter, 1977; Swaby, 1976; Hansen, 1979; Ausubel & Fitzgerald, 1962; Groteleuscher & Sjorgren, 1968; Ausubel & Youssef, 1963; Royer & Cable, 1976, 1975). Therefore, teachers should use instructional techniques facilitating the linkage of the known to the new. There is also limited research suggesting that discourse analysis tasks facilitates comprehension (Christopherson, 1976, 1979; Doctorow, Wittrock, & Marks, 1978). However, more research needs to be conducted regarding the effects on comprehension of using instructional procedures designed to increase students' awareness of factors in the microstructure of text.

There was a significant difference for question type. Better readers and poorer readers achieved a higher performance on implicit than implied question types. Overall, poorer readers experienced more difficulty than better readers on both types of questions. These results indicate that teachers must be aware of the difficulty level of their questions. They should help students, in general, and poorer readers, in particular, with questions on propositions which are implied in the text. If the implied propositions are connective propositions, the reader has to recall specific ideas (propositions) and mentally relate the ideas to each other. This two-step process is difficult for all readers.

Limitations of the Study

The following limitations of this study have been recognized:

(1) There was no control group in this study, that is, there was not a group receiving no instruction. The lack of such a control group prevented a comparison of results from the two experimental methods against a baseline measure of no instruction. However, previous research does indicate that some instruction is better than no instruction (Swaby, 1977; Sloan & Pearson, 1978; Vacca, 1975; Doctorow, Wittrock, & Marks, 1978).

(2) Since students were assigned to reading ability groups (high, low) based on their within grade (subject pool) ranking, the low ability readers in this study comprised the lower half of the sample. Their mean score on the pretest, when compared to national norms, placed them in

the average range. Therefore, caution should be used in generalizing the results of this study to a population of readers who are reading, on the average, below grade level.

(3) This study was conducted in a private elementary school. Hence, the findings cannot be generalized to other schools, especially public elementary schools.

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